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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 1: Basic Research				R-1 ITEM NOMENCLATURE PE 0601103F: University Research Initiatives							
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	133.526	141.524	136.297	0.000	136.297	140.273	145.093	147.415	149.702	Continuing	Continuing
615094: University Research Initiatives	133.526	141.524	136.297	0.000	136.297	140.273	145.093	147.415	149.702	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program supports defense-related basic research in a wide range of scientific and engineering disciplines pertinent to maintaining U.S. military technology superiority; enhances and promotes the education of U.S. scientists and engineers in disciplines critical to maintaining, advancing, and enabling future U.S. defense technologies; and assists universities in establishing superior instrumentation capabilities needed to improve the quality of defense-related research and education. A fundamental component of this program is the recognition that future technologies and technology exploitations require highly coordinated and concerted multi- and interdisciplinary efforts. This program is in Budget Activity 1, Basic Science, because it funds scientific study and experimentation.

B. Program Change Summary (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	137.056	132.249	0.000	0.000	0.000
Current President's Budget	133.526	141.524	136.297	0.000	136.297
Total Adjustments	-3.530	9.275	136.297	0.000	136.297
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.585			
• Congressional Adds		9.860			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-3.530	0.000	136.297	0.000	136.297

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 615094: University Research Initiatives

FY 2009	FY 2010
0.798	0.000

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<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2009	FY 2010
Congressional Add: <i>Partnership in Innovative Preparation for Educators and Students (PIPES) and the Space Education Consortium (SEC).</i>			
Congressional Add: <i>High Temperature Hydrogen Energy Production.</i>		1.197	0.797
Congressional Add: <i>Battle Space Reducing Military Decision Cycles.</i>		1.277	0.000
Congressional Add: <i>Secure Network Centric Operations.</i>		1.596	1.693
Congressional Add: <i>Aerodynamic Wind Tunnel Upgrade Initiative.</i>		1.596	0.000
Congressional Add: <i>Cyber Security Laboratory at Louisiana Tech University.</i>		2.991	1.195
Congressional Add: <i>Lean Management System Research Initiative at Air Mobility Wing MacDill AFB.</i>		0.798	0.000
Congressional Add: <i>Rapid Prototyping and Nanotechnology Initiative.</i>		0.798	0.000
Congressional Add: <i>Unmanned Aerial Systems Mission Planning and Operation Center.</i>		0.399	2.788
Congressional Add: <i>Cyber Innovation Center (CIC) Research and Development Seed Fund.</i>		0.000	0.797
Congressional Add: <i>Energy and Sensor Informatics Research and Transition.</i>		0.000	0.797
Congressional Add: <i>Frank R. Seaver Science and Engineering Initiative.</i>		0.000	1.753
Congressional Add Subtotals for Project: 615094		11.450	9.820
Congressional Add Totals for all Projects		11.450	9.820
<u>Change Summary Explanation</u>			
Note: The FY 2010 President's Budget summittal did not reflect FY 2011 through FY 2015 funding. A detailed explanation of changes between the two budget positions is not provided because it cannot be made in a relevant manner.			
Note: In FY 2010, Congress added \$1.2 million for Cyber Security Research Program/Cyber Security Laboratory, \$2.8 million for Unmanned Aerial Systems Mission Planning and Operation Center, \$0.8 million for Energy and Sensor Informatics Research and Transition, \$1.76 million for Frank R. Seaver Science and Engineering Initiative, \$0.8 million for Cyber Innovation Center (CIC) Research and Development Seed Fund, \$1.7 million for Cybersecurity for Control Networks Research, and \$0.8 million for High Temperature Hydrogen Energy Production Facility.			

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C. Performance Metrics (U) Under Development.		

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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost												
615094: <i>University Research Initiatives</i>	133.526	141.524	136.297	0.000	136.297	140.273	145.093	147.415	149.702	Continuing	Continuing												
<p><u>A. Mission Description and Budget Item Justification</u></p> <p>This program supports defense-related basic research in a wide range of scientific and engineering disciplines pertinent to maintaining U.S. military technology superiority; enhances and promotes the education of U.S. scientists and engineers in disciplines critical to maintaining, advancing, and enabling future U.S. defense technologies; and assists universities in establishing superior instrumentation capabilities needed to improve the quality of defense-related research and education. A fundamental component of this program is the recognition that future technologies and technology exploitations require highly coordinated and concerted multi- and interdisciplinary efforts. This program is in Budget Activity 1, Basic Science, because it funds scientific study and experimentation.</p> <p><u>B. Accomplishments/Planned Program (\$ in Millions)</u></p> <table border="1"> <tr> <td></td> <td>FY 2009</td> <td>FY 2010</td> <td>FY 2011 Base</td> <td>FY 2011 OCO</td> <td>FY 2011 Total</td> </tr> <tr> <td> MAJOR THRUST: Promote fundamental, multi- and interdisciplinary science and engineering research projects. <i>FY 2009 Accomplishments:</i> In FY 2009: Continued funding competitive research awards at U.S. universities to focus on underpinning Air Force-related technologies usually not achievable through typical single investigator awards. Supported and recognized superior academic researchers in the early stages of their career through the Presidential Early Career Award for Scientists and Engineers (PECASE) program. Continued funding of multi-disciplinary programs initially awarded in prior years. <i>FY 2010 Plans:</i> In FY 2010: Continue funding competitive research awards at U.S. universities to focus on underpinning Air Force-related technologies usually not achievable through typical single investigator awards. Support and recognize superior academic researchers in the early stages of their career </td> <td align="right">70.144</td> <td align="right">72.793</td> <td align="right">75.646</td> <td align="right">0.000</td> <td align="right">75.646</td> </tr> </table>													FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	MAJOR THRUST: Promote fundamental, multi- and interdisciplinary science and engineering research projects. <i>FY 2009 Accomplishments:</i> In FY 2009: Continued funding competitive research awards at U.S. universities to focus on underpinning Air Force-related technologies usually not achievable through typical single investigator awards. Supported and recognized superior academic researchers in the early stages of their career through the Presidential Early Career Award for Scientists and Engineers (PECASE) program. Continued funding of multi-disciplinary programs initially awarded in prior years. <i>FY 2010 Plans:</i> In FY 2010: Continue funding competitive research awards at U.S. universities to focus on underpinning Air Force-related technologies usually not achievable through typical single investigator awards. Support and recognize superior academic researchers in the early stages of their career	70.144	72.793	75.646	0.000	75.646
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total																		
MAJOR THRUST: Promote fundamental, multi- and interdisciplinary science and engineering research projects. <i>FY 2009 Accomplishments:</i> In FY 2009: Continued funding competitive research awards at U.S. universities to focus on underpinning Air Force-related technologies usually not achievable through typical single investigator awards. Supported and recognized superior academic researchers in the early stages of their career through the Presidential Early Career Award for Scientists and Engineers (PECASE) program. Continued funding of multi-disciplinary programs initially awarded in prior years. <i>FY 2010 Plans:</i> In FY 2010: Continue funding competitive research awards at U.S. universities to focus on underpinning Air Force-related technologies usually not achievable through typical single investigator awards. Support and recognize superior academic researchers in the early stages of their career	70.144	72.793	75.646	0.000	75.646																		

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
through the PECASE program. Continue funding of multi-disciplinary programs initially awarded in prior years. FY 2011 Base Plans: In FY 2011: Continue funding competitive research awards at U.S. universities to focus on underpinning Air Force-related technologies usually not achievable through typical single investigator awards. Support and recognize superior academic researchers in the early stages of their career through the PECASE program. Continue funding of multi-disciplinary programs initially awarded in prior years. FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Support post-graduate, graduate, and undergraduate education in science and engineering disciplines at U.S. universities. FY 2009 Accomplishments: In FY 2009: Continued to award highly competitive NDSEG fellowships. Continued to support competitive awards for graduate and undergraduate research experiences including those established under the Awards to Stimulate and Support Undergraduate Research Education (ASSURE) program. Continued funding for awards made under prior year Department of Defense programs. FY 2010 Plans: In FY 2010: Continue to award highly competitive NDSEG fellowships. Continue to support competitive awards for graduate and undergraduate research experiences including those established under the ASSURE program. Continue funding for awards made under prior year Department of Defense programs.		39.519	43.932	45.250	0.000	45.250

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: In FY 2011: Continue to award highly competitive NDSEG fellowships. Continue to support competitive awards for graduate and undergraduate research experiences including those established under the ASSURE program. Continue funding for awards made under prior year Department of Defense programs.						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Enhance the scientific and engineering research through advanced education infrastructure and instrumentation at U.S. universities.		12.413	14.979	15.401	0.000	15.401
FY 2009 Accomplishments: In FY 2009: Continued to conduct the competition for U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance research and educational capabilities under the Defense University Research Instrumentation Program (DURIP).						
FY 2010 Plans: In FY 2010: Continue to conduct the competition for U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance research and educational capabilities under the DURIP.						
FY 2011 Base Plans: In FY 2011: Continue to conduct the competition for U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance research and educational capabilities under the DURIP.						
FY 2011 OCO Plans: In FY 2011 OCO: Not Applicable.						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Planned Programs Subtotals		122.076	131.704	136.297	0.000	136.297
		FY 2009	FY 2010			
Congressional Add: Partnership in Innovative Preparation for Educators and Students (PIPES) and the Space Education Consortium (SEC). FY 2009 Accomplishments: In FY 2009: Conducted multi-disciplinary research associated with information network for educators and students. FY 2010 Plans: In FY 2010: Not Applicable.		0.798	0.000			
Congressional Add: High Temperature Hydrogen Energy Production. FY 2009 Accomplishments: In FY 2009: Conducted research to develop methods for hydrogen production. FY 2010 Plans: In FY 2010: Not Applicable.		1.197	0.797			
Congressional Add: Battle Space Reducing Military Decision Cycles. FY 2009 Accomplishments: In FY 2009: Continued developing decision-making tool that can result in rapid and effective analyses of battlefield situational elements and recommendations for response.		1.277	0.000			

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B. Accomplishments/Planned Program (\$ in Millions)		
	FY 2009	FY 2010
<i>FY 2010 Plans:</i> In FY 2010: Not Applicable.		
Congressional Add: Secure Network Centric Operations. <i>FY 2009 Accomplishments:</i> In FY 2009: Conducted research on the security issues in information technology architectures and components. <i>FY 2010 Plans:</i> In FY 2010: Not Applicable.	1.596	1.693
Congressional Add: Aerodynamic Wind Tunnel Upgrade Initiative. <i>FY 2009 Accomplishments:</i> In FY 2009: Supported major facility renovation and diagnostic capability acquisition for the University of Arizona Wind Tunnel. <i>FY 2010 Plans:</i> In FY 2010: Not Applicable.	1.596	0.000
Congressional Add: Cyber Security Laboratory at Louisiana Tech University. <i>FY 2009 Accomplishments:</i> In FY 2009: Focused on new and theoretically sound profiling techniques for detection and identification of terrorists and cyber attacks.	2.991	1.195

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B. Accomplishments/Planned Program (\$ in Millions)		
	FY 2009	FY 2010
<i>FY 2010 Plans:</i> In FY 2010: Not Applicable.		
Congressional Add: Lean Management System Research Initiative at Air Mobility Wing MacDill AFB. <i>FY 2009 Accomplishments:</i> In FY 2009: Facilitated civilian education and training program at the base. <i>FY 2010 Plans:</i> In FY 2010: Not Applicable.	0.798	0.000
Congressional Add: Rapid Prototyping and Nanotechnology Initiative. <i>FY 2009 Accomplishments:</i> In FY 2009: Conducted rapid prototyping and automatic construction of physical objects with 3D printers, stereo lithography machines, or special laser sintering systems. <i>FY 2010 Plans:</i> In FY 2010: Not Applicable.	0.798	0.000
Congressional Add: Unmanned Aerial Systems Mission Planning and Operation Center. <i>FY 2009 Accomplishments:</i> In FY 2009: The Unmanned Aerial Systems (UAS) Mission Planning and Operation Center worked with the Great Plains Joint Regional Training Center to train Guard personnel in mission planning and aircraft operation for homeland security and disaster missions using the CQ-10 Snowgoose UAS platform owned by the Guard.	0.399	2.788

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B. Accomplishments/Planned Program (\$ in Millions)		
	FY 2009	FY 2010
<i>FY 2010 Plans:</i> In FY 2010: Not Applicable.		
Congressional Add: Cyber Innovation Center (CIC) Research and Development Seed Fund. <i>FY 2009 Accomplishments:</i> In FY 2009: Not Applicable. <i>FY 2010 Plans:</i> In FY 2010: Utilize seed funds to establish a Research and Development Cyber Information Center.	0.000	0.797
Congressional Add: Energy and Sensor Informatics Research and Transition. <i>FY 2009 Accomplishments:</i> In FY 2009: Not Applicable. <i>FY 2010 Plans:</i> In FY 2010: Conduct fundamental research in the energy and sensor informatics discipline to increase knowledge and accelerate transitions to military applications.	0.000	0.797
Congressional Add: Frank R. Seaver Science and Engineering Initiative. <i>FY 2009 Accomplishments:</i> In FY 2009: Not Applicable. <i>FY 2010 Plans:</i> In FY 2010: Support the Frank R. Seaver Science and Engineering Complex in conducting basic research in science and engineering disciplines.	0.000	1.753

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B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010			
Congressional Adds Subtotals							11.450	9.820			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PE 0601102F: <i>Defense Research Sciences.</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
D. Acquisition Strategy Not Applicable.											
E. Performance Metrics Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.											

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